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SOME GYNANDROMORPHS OF EPHEMEROPTERA

BY H. T. SPIETH* AND F. P. IDE**

Gynandromorphs have been reported from many orders of insects and especially from those orders in which large numbers of individuals have been collected or reared. It is therefore not surprising that, with the accumulation of large series, ephemerid gynandromorphs should be found occasionally and it seems advisable to put descriptions of such individuals on record. Needham, Traver, Hsu, etc. (Biology of Mayflies, p. 114) described a gynandromorph of the *interpunctatum* group of the genus *Stenonema*. The specimens described below are ones that have been found in the collections of the authors of the present paper. The description of the gynandromorph of *Leptophlebia* is by F. P. I. and those of *Stenonema* and *Potamanthus* are by H. T. S.

Leptophlebia mollis Hag.

The specimen was found in a collection of mayflies made by F. P. I. at Lachine, P. Q., on June 5, 1933. In this species as in most mayflies there is marked sexual dimorphism involving the forelegs, the compound eyes, the colour of the abdomen and the external genitalia.

In the normal male (Fig. 1 a, b, c) the compound eyes are large and almost contiguous over the vertex of the head, whereas in the normal female (Fig. 3 a, b, c) the compound eyes are small, the width of the vertex being about four times the width of the eye. In the male the fore-legs are long, the femur being nearly twice as long as that of the female and the other segments correspondingly longer. The fore-femur in the male is hyaline white and that of the female is tinged with brown. Abdominal segment one of the male is dark reddish brown on both tergum and sternum. Segments 2 to 7 inclusive are hyaline white throughout and segments 8, 9, and 10 are reddish brown above and below. In the female on the other hand, the abdominal segments are uniformly reddish brown. The male has jointed claspers or gonapods borne by the sternum of segment 9, with the penes opening dorsal to them. The female has the opening of the oviduct between sterna 7 and 8 and lacks gonapods.

In the gynandromorphic individual (Fig. 2 a, b, c) there is a mixture of male and female characters. The eyes are small as in a female individual and not intermediate between the two sexes. The forelegs are short as in the normal female, but are slightly longer than in this sex. The fore-femora are tinged with brownish as in the female. The left hind leg is about one-half the length of the right hind leg, apparently a regenerated limb. The abdomen is very curiously marked in a piebald fashion in brown and hyaline white. Segment 2 hyaline white on the left side from the mid dorsal line to the mid ventral line, and reddish brown (as in female) on the right side. Segment 3 evenly reddish brown on the right side from the mid dorsal line to the pleural fold, hyaline white from the pleural fold to the mid ventral line and hyaline white on the left side. Segment 4 reddish brown from the mid dorsal line to the pleural fold and hyaline white below the fold to the mid ventral line on the right side; left side hyaline white from the mid dorsal line to the pleural fold with the exception of a very restricted reddish brown patch in the postero-lateral angle and evenly reddish brown from the pleural fold to the median ventral line.

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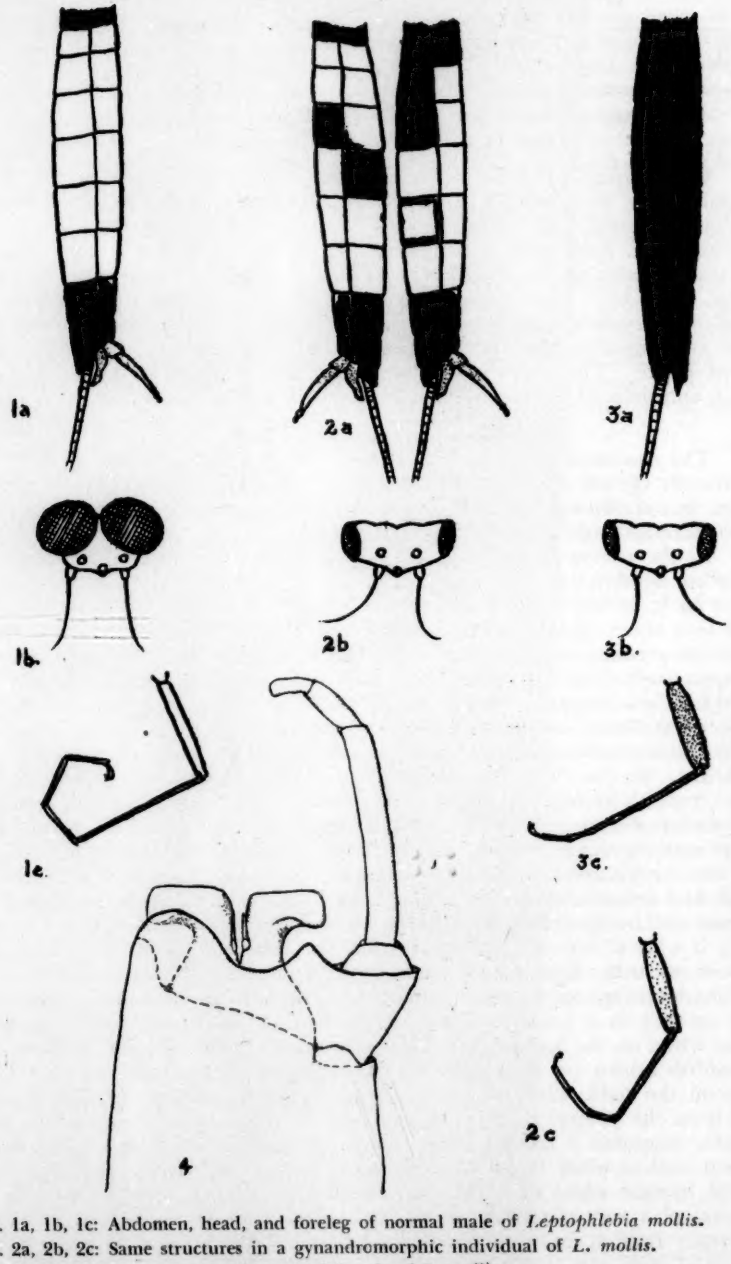
PLATE 24



Figs. 1a, 1b, 1c: Abdomen, head, and foreleg of normal male of *Leptophlebia mollis*.
Figs. 2a, 2b, 2c: Same structures in a gynandromorphic individual of *L. mollis*.
Figs. 3a, 3b, 3c: same structures in normal female of *L. mollis*.
Fig. 4: Genitalia of a gynandromorph of *Stenonema terminatum*.

Segment 5 hyaline white throughout on the right side and from the pleural fold to the median ventral line on the left side; evenly reddish brown from the mid dorsal line to the pleural fold on the left side. Segment 6 hyaline white except that on the right side only there is a narrow reddish brown line along the mid dorsal line continued as a narrow line along the anterior and posterior margins of the segment from the mid dorsal line to the pleural fold. Segment 7 hyaline white throughout. Segments 8, 9, and 10, as in the normal male. The gonapods and claspers are well developed and, as far as can be made out, similar to those in the normal male as are also the penes. This individual has definitely the characters of a female at the anterior and those of a male at the posterior end.

No eggs are visible within the abdomen, and presumably testes are present, or there may be no gonads developed.

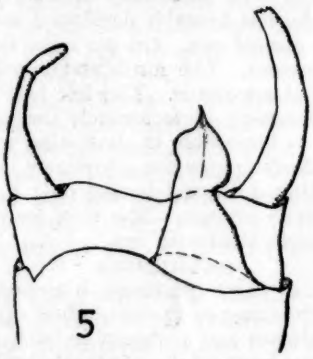


Fig. 5: Genitalia of a gynandromorph of *Potamanthus flaveola*.

Stenonema terminatum Walsh (dried)

The specimen was collected by H. T. S. at Murphy, North Carolina, April 23, 1935. It is about half male and half female. The coloration is that of a typical male with the exception of the head which is pigmented like that of a female. The head is in all respects that of a female except for the eyes which are somewhat larger than those of a normal female. The thorax and all of its appendages are typically masculine. The abdomen appears to be masculine except that: (1) Eggs can be clearly observed occupying the dorsal portions of segments one to seven inclusive. These eggs masses are, however, only about one-third the volume of those found in normal females. (2) The genitalia (fig. 4) are incomplete. Only the right forceps limb is present. Basally this limb is attached to a plate which, on the right side, appears as a normal styliger plate and on the left side appears to be part of a female subanal plate. Distally the penes appear normal, but basally the attachment is considerably distorted on the left side, although it is normal on the right side. There are no indications of oviducts or oviducal apertures which are normally to be found between the seventh and eigth segments.

Stenonema rubromaculatum Clemens (in alcohol)

The specimen was collected at Binghamton, New York, June 15, 1938, by Dr. Virgil N. Argo who kindly presented it to H. T. S. Its head is completely feminine. The right half of the thorax, including the wing, is clearly that of a female. This can be determined by the coloration as well as by the structure. Unfortunately, as often happens when heptagenines are preserved in fluid, the legs have broken off at the trochanters. Since this specimen was only one out of a large series, it is impossible to tell exactly what the legs of the right side were like. The remaining coxae and trochanters have coloration typical of a female. The left half of the thorax and the left wing are clearly masculine both

in structure and pigmentation. The left fore-ieg is missing, but left meso- and metathoracic legs are present and the latter, plus the coxa and trochanter of the fore-leg, are clearly masculine. The entire abdomen is that of a male normal in all respects.

Potamanthus flaveola Walsh (in alcohol)

The specimen was collected at Wyandotte, Oklahoma, April 4, 1934, by the Oklahoma Natural History Survey. In this species, the sexual dimorphism is greater than in most species of *Potamanthus.* Thus the compound eyes of the males are larger than those of the females, and the cross veins of the wing disk of the males are colorless, while those of the females are blackish. In this particular specimen the head, thorax and the thoracic appendages are clearly feminine.

In the abdomen the left ovary is developed normally. The entire left side is full of apparently normal ova. On the right side of the abdomen there appears to be no ovary present. The ninth abdominal segment (Fig. 5) bears an incomplete male genital apparatus. The left half of the genital apparatus seems normal to all appearance. Unfortunately the tip of the left forceps had been broken and thus it is impossible to determine whether it was completely normal. On the right side the penes are completely lacking, and the forceps is obviously not normal, being short and having only a single distal segment instead of two as are normally present. The duct leading into the normal left penis is, interestingly enough, filled with ova.

SIGNIFICANCE

Since the ancestry of these specimens is unknown, it is scarcely worth while to speculate upon the cause or causes of their origin. It should be noted that the amount of femaleness and maleness in each specimen varies between individuals. Thus, the specimen of *Leptophlebia mollis,* while female at the anterior and male at the posterior end, shows a peculiar mosiac appearance in coloration of the abdomen. Likewise the bisexuality of the specimen of *Stenonema rubromaculatum* involves both structural and pigmentary characteristics. In the case of *S. terminatum,* however, the bisexuality involves the structure of the head and abdomen only.

In the light of what has been found in other insects, such variations in bisexuality between individuals is to be expected. Further, in the future we may expect to discover individual ephemerids that show varying degrees of bisexuality. Lastly, the bilateral bisexuality of the posterior end of the abdomen of *S. terminatum* (fig. 4) indicates that the styliger plate of the male genitalia is the homolog of the subanal plate of the female.

A NEW SPECIES OF IPS (COLEOPTERA, SCOLYTIDAE)

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The small group of the genus *Ips* placed at the end of Dr. Swaine's key seems to have a character not found elsewhere in the genus. The epistomal region, in the males, is elevated and often has a dense brush of hairs which make the elevation look greater than it really is. However, this brush is often rubbed until it has entirely disappeared. This has apparently given rise to the idea that two entirely different females are associated with the males in the same gallery.

The group so far has comprised the species *tridens* Mann., *engelmanni* Sw., and *yohoensis* Sw. *Ips pilifrons* Sw. has also been included, but it seems doubtful to me that the male mentioned by Dr. Swaine is really the male of this species. It is probably the male of an undescribed species from Colorado. The new species herein described is the smallest of the group.

Canadian Bark Beetles, Part II, Bul. 14, Dept. of Agr., Canada, 1918.

Ips swainei n. sp.

Holotype—male. Length 3 mm. Head black with epistomal area slightly elevated with a moderately dense brush of erect hairs, the area behind the brush smooth, shining and inconspicuously, sparsely punctate. Antennae with club nearly round, pale yellow except the basal segment which is shining brown, sutures bisinuate.

Pronotum slightly longer than wide, roughened as usual in front, sparsely punctured and shining behind, with a shallow, median sulcus.

Elytra with striae moderately impressed and with large punctures, interspaces comparatively wide, from the first to the fourth with a few scattered punctures. The marginal half of the elytra rather coarsely, confusedly punctured. The elytral declivity sparsely, irregularly punctured, with three teeth equally distant from the basal margin, the middle tooth slightly larger than the others.

The colour varies from light to dark brown, head black and sparsely covered with rather long hairs.

Allotype—female. Length 3 mm. Differs from the male only by the front of the head which lacks the brush and epistomal elevation, the front being evenly convex and conspicuously, sparsely punctured.

Holotype—Creighton Val., Lumby, B. C., VI-18-1922, *Picea engelmanni;* No. 4438, in the Canadian National Collection, Ottawa.

Allotype—Creighton Val., Lumby, B. C., VI-10-1922.

Paratypes—12 ♂ ♂ and 12 ♀ ♀, all from Creighton Valley, Lumby, B. C., on *Picea engelmanni.*

Holotype, Allotype and Paratypes in the Canadian National Collection. Paratypes in the Academy of Sciences, San Francisco, Calif. and in the collection of the author. A series of this species has also been taken at Trinity Valley on the same host.

The males of this group may be separated by the following characters:

A. The front of the head enormously elevated and nearly naked. ..... *tridens* Mann.

AA. The front of the head moderately elevated.

B. The front of the head with normally a strong brush.

C. The brush composed of straight, erect hairs; of small size, 3 to 3½ mm. ..... *swainei* R. Hop.

CC. The brush composed of incurved hairs; of larger size 4.5 mm. ..... *engelmanni* Sw.

BB. The front of the head without a brush, merely pubescent ..... *yohoensis* Sw.

Ips swainei however can always be distinguished by the small size and sparsely punctured front. In the armature of the declivity, the small tooth at the end of the suture, common to all species of *Ips,* is not counted in the description of *Ips swainei.* In the writer's opinion it would simplify descriptions if mention of this sutural tooth were omitted.

DISTRIBUTIONAL AND TAXONOMIC NOTES ON SOUTHEASTERN DERMAPTERA AND ORTHOPTERA, AND A NEW SPECIES OF *CYCLOPTILUM* (GRYLLIDAE).

BY H. F. STROHECKER

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Most of the records which follow are the compilation of field work during the period of September 1936 to September 1937 and the summer of 1938 while I was a member of the faculty of the University of Miami. Several able Orthopterists, particularly J. A. G. Rehn, Morgan Hebard, W. T. Davis, A. P. Morse, and T. H. Hubbell have collected widely in southeastern United States, describing many new species. This report is intended as an addendum; attention

is particularly directed to those species, either wide-ranging or localized, of which records have appeared infrequently. One new species is described from southern Florida.

Labidura bidens (Oliv.) Florida: Coral Gables, IV-14-37, 2 males, 1 female between crevices of stones in walk around fountain. Georgia: Macon, IX-1-37, 1 male in crevice in steps of swimming pool.

Doru lineare (Eschs.) Florida: Ft. Lauderdale, X-10-36, 4 males, 2 females; XI-3-36, 2 females; V-1-37, 1 male; Hollywood, VIII-3-38, 1 female; Coral Gables, IV-3-37, 1 female. All these specimens were swept from tall grasses. Mr. Hebard identified the species and writes that these are the first records from Florida.

Aglaopteryx gemma Hebard. Taken at several Florida localities and at Macon, Georgia, VIII-25-38, 1 female in molasses trap.

Stagmomantis floridensis Davis. Florida: Ft. Lauderdale, X-10-36, 1 female; Pinecrest, X-11-31, 1 female (E. M. Miller).

Oligonyx scudderi Saussure. Florida: Ft. Lauderdale, XI-3-36, 2 females (imm.); Miami, XII-36, 1 female.

Mantoida maya Sauss. & Zehnt. Florida: Hollywood, VII-10-37, 1 female; VIII-6-37, 1 male, 1 female; VII-13-38, 1 female. About a dozen specimens in all were seen but in the stiff tangle of seagrape branches, where they were found, the capture of specimens was a most difficult matter. The last female recorded was found resting on grass at night.

Brunneria borealis Scudder. Georgia: Macon, IX-8-28, 1 female; X-1-32, 1 female; VIII-29-38, 4 females. Identified, from a description, by Henry Fox who adds the following Georgia records: Macon, X-25-20, 1 female (C. J. Broome); VI-9-22, 2 juv., early instars, provisionally referred to this species; IX-20-22, 1 adult (sex not noted); X-24-23, 1 adult (sex not noted); X-4, 5-24, 4 females. Vidalia, IX-24-22, 2 females; IX-20-23, 2 adults (sex not noted).

Manomera brachypyga R. & H. Florida: Pinecrest, V-15-37, 3 males, 1 female; VI-29-37, 1 male; Long Pine Key, VII-1-38, 2 males, 1 female.

Aplopus mayeri Caudell. Bahia Honda Key, Florida, VIII-15-38, 3 males (1 imm.), 4 females, on bay cedar. The females differ greatly in size; the largest measures 133 mm. (excluding oviscapt), the smallest 108 mm.

Paratettix rugosus (Scudder). Florida: Deep Lake, II-27-37, 2 males, 2 females; Coral Gables, XII-29-36 to VIII-9-37, 5 males, 3 females; Dania, VII-31-37, 1 female; Tavernier, X-10-36, 5 males, 2 females.

Tettigidea acuta Morse. Florida: Deep Lake, II-27-37, 6 males, 6 females; Silver Springs, VIII-27-37, 11 males, 8 females.

Radinotatum carinatum peninsulare R. & H. Florida: Numerous specimens from various localities in the immediate vicinity of Coral Gables; Okeechobee, VIII-15-38, 4 males, 1 female. 2 males and 2 females from Weirsdale are intermediate between *c. peninsulare* and Georgia specimens of *carinatum carinatum.*

Truxalis brevicornis (L.). Florida: Deep Lake, VII-24-37, 2 males. Abundant there in the rank vegetation, chiefly arrowhead, surrounding the lake.

Mermiria intertexta Scudder. Florida: Big Pine Key, VIII-18-37, 1 male, 1 female, in a growth of sawgrass in a pothole; Cape Sable, VI-12-37, 4 males, 3 females; Pinecrest, V-15-37, 2 males, 1 female.

Syrbula admirabilis (Uhler). Florida: Coral Gables, XI-26-36 to VIII-17-37, and VI-25-38 to VII-4-38, 11 males, 9 females. Frequent in wiregrass of pine woods. The males in this series average 28.8 mm. (27.5-29.7) in length as compared to an average for Macon, Georgia, specimens of 25 mm. (23.8-25.5).

Trimerotropis saxatilis McNeill. Georgia: Holton (8 miles n. e. of Macon), X-29-32, 3 males, 1 female. Found together with *S. marmorata picta*

(Scudder) on lichen-covered gneiss at an elevation of 650 feet. This record extends the known southward range of *saxatilis* about a hundred miles.

Eotettix signatus Scudder. Florida: Pinecrest, V-15-37 to VI-28-37, 5 males, 4 females; Ochopee, V-8-37, 4 males.

Eotettix pusillus Morse. Florida: Havana, VIII-20-38, 1 male, 3 females, in rank grasses by stream. Georgia: Macon, IX-3-37, 3 males, 1 female; VIII-25-38, 2 males, 1 female, in dry oak woods.

Aptenopedes hubbelli Hebard. Florida: Okeechobee, VIII-16-37, 3 males, 3 females. Also taken at Ft. Myers and Silver Springs.

Aptenopedes aptera coquinae Hebard. Florida: Coral Gables, scarce among saw palmetto in pine woods; Okeechobee, VIII-16-38, 3 males, 3 females (1 imm.). The Okeechobee specimens are tentatively assigned to this subspecies. The males have the ventral arm of the dorsal lobe of the penis much longer than the upper arm. The specimens are small for that form; the males average 16.9 mm. in length, the females 22.7.

Melanoplus foxi Hebard. Georgia: Macon, IX-3-37, 16 males, 7 females; VIII-25-38, 4 males, 1 female. The male genitalia of Jefferson County specimens, as figured by Hubbell (1), are entirely like those of these topotypic specimens.

Melanoplus acidocercus Hebard. Georgia: Macon, IX-3-37, 15 males, 7 females; VIII-25-38, 20 males, 9 females. Associated with *M. foxi* in an oak woodland on sand with an undergrowth of *Vaccinium*. Blatchley (2) reduced *acidocercus* to subspecific rank under *carnegiei* Morse. While the relationship is undoubtedly close the series from Macon shows no overlapping of distinctive characters of male cerci and genitalia with a series of *carnegiei* from Hapeville. *Acidocercus* apparently replaces *caregiei*, a Piedmont species, on the sandy soil of the coastal plain.

Melanoplus femur-rubrum propinquus Scudder. Florida: Locally abundant in such sites as roadsides and recently abandoned agricultural land. Apparently dependent, in south Florida, on conditions effected by human agency.

Melanoplus symmetricus Morse. Florida: Havana, VIII-20-38, 1 male. This specimen has the lower, distal angle of the cercus more acute than is shown by Morse (3). One other individual, presumably of this species, was seen in an hour's search in a small valley grown up in rank grasses and sweetgum saplings.

Arethaea phalangium (Scudder). Florida: Coral Gables, VI-18-37, 1 male, at light; VI-25-37, 2 males, 2 females (1 imm.); VII-2-37, 2 males; 2 females; VI-18-38 to VIII- 1-38, 3 males, 4 females (1 imm.). With the exception of the first specimen recorded, all were taken in wire grass in open pine woods. A female was observed ovipositing in the dwarf oak. One of the immature specimens has the right cephalic leg much shorter than the left, suggesting regeneration.

Stilpnochlora couloniana (Saussure). Florida: Delray Beach, XII-27-36, 3 immature females on papaya. These were reared to maturity on papaya leaves; two underwent one molt each, the other three molts. Coral Gables, VII-28-37, 1 imm. male; Dania, VII-31-37, 1 female.

Turpilia rostratum (R. & H.) Florida: No Name Key, XII-19-36, 1 male; Tahiti Beach (Coral Gables), I-19-37, 1 male; III-23-37, 4 males; IV-7-37, 2 males, 1 female; VIII-10-38, 4 males; Hollywood, VIII-10-37, 1 female; VIII-3-38, 1 female. All on buttonwood.

Lea floridensis (Beutenmüller). Florida: Coral Gables, VI-7-37 to VIII-9-37, 11 males (1 brown), 10 females (2 brown); VI-18-38 to VII-4-38, 6 males, 9 females, (3 brown). Several colonies of this insect were located in cabbage palmetto stands by the stridulations of the male. Females were taken by search in the folds of the palmetto fans. It is of interest to note that the brown in-

dividuals were found only in the dead, brown fans. Caged individuals fed upon cabbage, dwarf oak and on the green berries and pedicels of the cabbage palmetto but not on its leaves. *L. floridensis* is evidently strictly seasonal as the first calls heard in 1937 were on June 1. The maximum incidence of adults, as judged by their calls, came about the middle of July and by August 25 only occasional individuals were heard.

Belocephalus sabalis Davis. Florida: Coral Gables, frequent on cabbage palmetto and saw palmetto. Okeechobee, VIII-15-38, 2 males, 3 females. As noted by Hebard (4), specimens of this species from the southeastern portion of its range have the fastigium heavier and shorter than do more northern specimens.

Range of Measurements (mm.)

	Length body	Length fastigium	Length pronotum	Length Caudal femur	Length ovipositor
Coral Gables (16 males)	37.6-46.6	2.5-3.3	9.3-10.8	18-22	
Coral Gables (12 females) ..	40.3-48.4	2.8-3.9	9.3-9.8	20 21.5	16-17

Belocephalus sabalis simplex Hebard. Florida: Homestead, V-27-37, 4 males; VI-28-38, 10 males, 2 females; VII-1-38, 2 males, 1 female; Long Pine Key, VII-2-38 and VIII-5-38, 4 males, 3 females. Hebard (4) treated this form as a subspecies of *sleighti* Davis. The seven specimens from Long Pine Key, about two miles west of Royal Palm Park, show intergradation with *sabalis*. Both this form and typical *sabalis* differ from *sleighti* in the proportionately longer caudal femora. Comparison of the measurements below with those of *sabalis* as it occurs at Miami will show the lack of substantial characters for specific separation.

Range of Measurements (mm.)

	Length body	Length fastigium	Length pronotum	Length Caudal femur	Length ovipositor
Homestead (16 males)	32.3-38.6	1.9-2.4	7.8-8.9	14.6-17.5	
L. P. Key (4 males)	34.3-36.6	2.1-2.5	8.5 9.4	16.4-18.6	
Homestead (2 females)	33.5-34	2.3	8.1-8.6	17.7-18	15.
L. P. Key (3 females)	35.9-41.9	2.5-3.1	8.4-9.6	18.2-19.3	15.3-16.7

Belocephalus sabalis sleighti Davis. Florida: Big Pine Key, VIII-18-37, 5 males, 1 female (brown) in fans of palms (*Thrinax sp.*); Key West, VIII-13-38, 5 males in weed patches (*Bidens*) with no palms near.

Hebard (4) preserved *sleighti* as a specific name due to lack of specimens showing intergradation between *simplex* and *sabalis*. Such an intergradation exists, as shown above. With the material at my disposal I have found it impossible to distinguish clearly *sleighti* and *sabalis*. The curvature of the face seems an inadequate criterion inasmuch as some specimens of *sabalis* from Coral Gables show it. It may be most practical, in the long run, to synonomize *sleighti* and *simplex* and recognize only one quite variable species which would retain the name *sabalis* Davis.

Range of Measurements (mm.)

	Length body	Length fastigium	Length pronotum	Length Caudal femur	Length ovipositor
B. P. Key (5 males)	40.5-46.7	2.1-2.6	9.2-10.8	16.9-19.7	
1 female	41.3	2.4	8.8	18.4	16.5
Key West (5 males)	38-42.7	2.3-2.6	9.5-10.2	17.4-18.8	

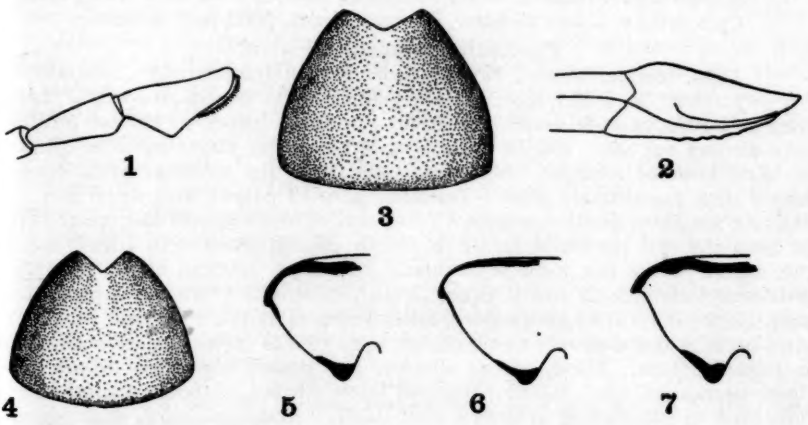
Belocephalus uncinatus Hebard. Florida: Hollywood, XI-11-36, 8 males, 3 females; VII-11-38 and VIII-3-38, 7 males, 1 female; Coconut Grove, VI-3-37, 1 male.

Belocephalus hebardi hebardi Davis. Florida: Coral Gables, XII-36,1 male; XI-5-31, 1 female (U. Miami col.).

Belocephalus hebardi proximus Hebard. Florida: Okeechobee, VIII-15-38, 5 males. 1 imm. female.

Belocephalus hebardi micanopy Davis. Florida: Big Pine Key, VIII-18-37 and VIII-13-38, 3 males (1 imm.) and 1 imm. female.

Hebard (4) allowed *micanopy* specific status on the basis of the isolation of the type locality and the lack of apical fastigial tooth in the paratypic specimen before him. In the small series at hand, the immature specimens have the apical tooth of the fastigium well developed; the two adult males have this tooth less developed but perfectly evident. (figs. 5 and 6). Davis (personal communication) tells me that the fastigial tooth is present on some of the paratypic specimens. Apparently there has been developing on Big Pine Key a population having the apical tooth of the fastigium reduced or absent, but in view of the



1. *Cycloptilum spectabile* sp. n. Last two joints of maxillary palp.
2. *Cycloptilum spectabile* sp. n. Apex of ovipositor.
3. *Cycloptilum spectabile* sp. n. Subgenital plate of ♀, ventral view.
4. *Cycloptilum trigonipalpum* (R. & H.) Subgenital plate of ♀, ventral view.
5. *Belocephalus hebardi micanopy* Davis. Fastigium of topotype.
6. *Belocephalus hebardi micanopy* Davis. Fastigium of topotype.
7. *Belocephalus h. hebardi* Davis. Fastigium of Miami specimen.

similarity of the specimens here recorded to *h. hebardi* as it occurs at Miami (fig. 7), it seems more reasonable to subordinate *micanopy* than to allow it specific status.

Pyrgocorypha uncinata (Harris). Florida: Royal Palm Park, IV-2-37, 2 males; Miami, II-4-35 (U. Miami col.), 1 female; Georgia: Hapeville, IX-7-37, 2 juvenile females in last nymphal instar, in reed patch.

The brevity of the stridulating period of this insect, noted by Allard (5), was also impressed upon me. In the spring of 1937 the first calls were heard on March 25; no stridulations were heard after April 10.

Homorocoryphus malivolans (Scudder). Florida: Princeton, IV-27-37, 1 male; Homestead, IV-27-37, 2 females (1 green); Ochopee, V-8-37, 1 male; Coral Gables, VI-29-37 to VIII-21-37, 4 males (1 macropterous), 4 females (macropterous); Pinecrest, VI-29-37, 2 males (macropterous).

Common in areas of saw-grass in south Florida. The stridulation of the males is a soft, shuffling sound quite without ringing qualities. The macropterous individuals fly easily and have been taken at lights.

Conocephalus spartinae (Fox). Florida: taken at several perviously recorded localities and at Tavernier, Key Largo, X-11-36, 4 males, 4 females. These were found in sparse vegetation within a few feet of the shore-line.

Atlanticus glaber R. & H. Florida: Coral Gables, III-27-37 to VI-7-37, 6 males, 2 females; VI-25-38, 1 female; these in dry pine woods on oolite; Pinecrest, V-13-37, 1 male, 2 females. At Pinecrest the immediate substrate is sand upon which is developed a pine woods with undergrowth of wire-grass and cabbage palmetto. During the summer this area is flooded. *A. glaber* evidently is adapted to wide extremes in moisture.

Ceuthophilus peninsularis R. & H. Florida: Long Pine Key, about two miles west of Royal Palm Park, VIII-10-38, 2 males, 1 female (all large imm.) in molasses trap. Probably occurs in small, very localized colonies. Although ten traps were set out, all three specimens were taken in one jar which was planted in the moist sand of a pot-hole.

Scapteriscus acletus R. & H. Georgia: Macon, IX-2-37, 1 male, at light.

Cycloptilum bidens Hebard. Florida: Miami, VIII-9-37, 1 female.

Cycloptilum spectabile sp. n.

Type, female, Miami, Florida, June 1938 (Hebard col.) Resembles *C. trigonipalpum* (R. & H.) more than any other North American species. Larger than *trigonipalpum* or *antillarum* Redt. Dividing fissure of frontal protuberance distinct but fine. Dorsal breadth of protuberance about equal to diameter of basal joint of antenna. Maxillary palpi with the terminal joint one-fifth longer than penultimate joint. Terminal joint of palpus with distal face very oblique; length of distal face almost twice that of lower side of last joint. Viewed from the end the distal face is distinctly oblong whereas in *trigonipalpum* this aspect of the last joint is circular. Pronotum tubular, short, tapering a little anteriorly. Cerci almost equal to body in length. Ovipositor proportionately shorter than in *trigonipalpum,* lower valves crenulate near tip. Subgenital plate broadly and shallowly v-excised; the apex of this excision more obtuse than in *trigonipalpum.* Hind femora slender, not greatly expanded toward base. Head, pronotum, cerci, mouth-parts and lower surface of thorax including legs deep pink in life, fading to brown after death. Abdomen black, each segment with an apical tuft of white scales appearing as a ring.

Allotype, male, Miami, Florida, July 3, 1937 (Hebard col.). Head and maxillary palpi as in female. Pronotum tapering decidedly but evenly forward, completely concealing the tegmina. Antennae about four times the length of body. Color as in female.

Readily distinguished from other North American species by its large size and the strongly oblique distal face of the last joint of the labial palpi. The coloration, in life, is also distinctive.

Range of Measurements (mm.)

	Length body	Length pronotum	Caudal width pronotum	Length c. femur	Width c. femur	Length cerci	Length ovip.
16 males	9.6-14.2	4-5.3	2.5-3.4	4.7-6.7	1.7-2.1	7-12.3	
14 females .	10.2-12.8	2.5-2.6	2.3-2.4	5.8-6.6	1.9-2.0	9.8-11.4	4.7-5.3
Avg. males	12.3	4.7	3.1	6.2	1.9	10.5	
Avg. females	11.6	2.5	2.4	6.2	1.9	10.7	4.8

This cricket has been taken by me only in the red mangrove growths bordering Biscayne Bay just south of Miami. The first specimens were collected in the summer of 1937 in the mangroves on the bay edge of a remnant of Brickell's Hammock. In the summer of 1938 it was found in a similar habitat at the locality known as Tahiti Beach. Beating discovered only a few; most of the specimens were taken by search in the dead, rolled leaves of the mangroves and in the deserted nests of larvae of the hesperiid *Phocides batabano* (Lucas). The restriction of this insect to a small area in the vicinity of Miami (I have

searched for it elsewhere) suggests its recent colonization of this area from some more southern point.

All the recorded specimens beside the type and allotype have been designated paratypes. Paratypes will be deposited in the collections of Morgan Hebard, University of Michigan and B. B. Fulton.

Hygronemobius alleni (Morse). Florida: Coconut Grove, VI-20-38, 23 males, 22 females, on muck of mangrove swamp at the locality known as Tahiti Beach. *H. alleni* was abundant at this place but has not been seen by me at other points along the bay shore.

Anaxipha imitator (Sauss.). Florida: Key Largo, IV-25-37, 1 male, 4 females, from leaf-covered floor of jungle growth. In the twilight prevailing there, these little crickets were very difficult to see when at rest, their colors matching exactly the leaf mold covering the earth. Consequently, although many were seen to fly up, a few only were captured.

Phylloscyrtus pulchellus Uhler. Florida: Havana, VIII-20-38, 2 males, 1 female on sweetgum saplings.

Hapithus brevipennis Sauss. Numerous specimens collected in the summers of 1937 and 1938 at the following Florida localities: Miami, Ft. Myers, Ft. Lauderdale, Silver Springs, Okeechobee, Weirsdale and Havana. Not uncommon if looked for in the fans of saw palmetto. Miami specimens are decidedly larger than those from farther north in Florida.

Tafalisca lurida F. Walker. Florida: Coconut Grove (Tahiti Beach), I-9-37, 3 females (1 imm.); III-23-37, 1 male, 1 female; IV-7-37, 1 male; V-26-37, 1 male. All these on buttonwood (*Conocarpus*). Brickell Hammock, VII-3-37, 1 female, on red mangrove; Bahia Honda, VIII-14-38, 1 female on bay Cedar (*Suriana*).

One of the female specimens from Coconut Grove presents an unusual anomaly; one antenna is completely lacking, there being no evidence of a socket, the other antenna is represented by a single jointed structure and one of the fore legs has three distinct tarsi.

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NOTES ON THE ORTHOPTERA OF NOVA SCOTIA AND NEWFOUNDLAND.

BY JOHN W. H. REHN,
Academy of Natural Sciences of Philadelphia.

The orthopterous fauna of this area of eastern Canada and of Newfoundland is exceedingly limited but at the same time is of considerable interest to those who are interested in the faunistics and ecology of this group.

Our knowledge of the Orthoptera of Nova Scotia is due largely to Peirs whose work is summarized in his "The Orthoptera (Cockroaches, Locusts, Grasshoppers and Crickets) of Nova Scotia; with Descriptions of the Species and Notes on their Occurrence and Habits" (1918, Trans. Nova Scotian Inst. Sci., XIV, 201-356); and Gooderham's contribution, "The Acrididae of Nova Scotia" (1917, Proc. Ent. Soc. Nova Scotia, 1916, 21-30). Also Walker's paper on the material collected by Bayard Long on Prince Edward Island and on the Magdalen Islands (1915, Can. Ent., XLVII, 339-344) is of considerable use to those interested in this fauna, as is Hebard's "Records of Orthoptera from Newfoundland" (1915, Ent. News, XXVI, 306).

The material recorded in this paper was for the most part collected by Mr. Bayard Long, the well-known botanist, and is in the collections of the Academy of Natural Sciences of Philadelphia except when otherwise noted.

ACRIDIDAE

Acrydinae

Nomotettix cristatus cristatus (Scudder). Nova Scotia. Colchester Co., Truro; April 22, 1917; one male. This specimen represents the abbreviate form.

Acrydium subulatum (Linnaeus). Nova Scotia. Picton Co., Millsville; 1908; one female; (Hebard Cln.). Colchester Co., Truro; July 7, 1913; (R. Matheson); one male; (Hebard Cln.). Kings Co., Kentville; June 3, 1923; (R. P. Gorham); one male; (Hebard Cln.). Two of the three examples before me are of the abbreviate type.

Acridiinae

Chorthippus longicornis (Latreille) *. Nova Scotia. Colchester Co., Truro; September 1, 1913; one female. Lunenburg Co., Pine Lake near Italy Cross; August 16, 1921; (B. Long); one male, one female. Digby Co., Long Island, Central Grove; August 28, 1921; (B. Long), in savannah; two females. Yarmouth Co., Gavelton Lake, Gavelton; August 13, 1921; (B. Long); one male, three females: Tusket Lake, Gavelton; August 13, 1921; (B. Long); one female: Bog barrens West of Goose Lake; August 11, 1920; (B. Long); one male, one female: Gillfilley Lake, Quinan; August 23, 1921; (B. Long); one female. Shelbourne Co., Beaver Dam Lake (Bower's Lake); September 10, 1921; (B. Long); one male, one female.

Newfoundland. Port-aux-Basques; August 21, 1929, (B. Long; bog barrens); one female. Bay Bulls; August 21, 1924; (B. Long); two females.

Practically all of the material before me represents the brachypterous phase of this species although there are some examples of the macropterous condition. Also the general size of this series averages quite small.

Stethophyma lineatum (Scudder). Nova Scotia. Digby Co., Tiddville, Digby Neck; September 22, 1930; (B. Long; in boggy swale along fast run); one female. Lunenburg Co., Frank Lake near Big Mushamush Lake; August 17, 1921; (B. Long); two males, three females. Yarmouth Co., Salmon Lake; August 13, 1920; (B. Long; in swale); one male: Gavelton Lake, Gavelton; July 1921; (B. Long); one male: Wilson's Lake near Springhaven; August 23, 1921; (B. Long); two females: Gillfilley Lake, Quinan; August 23, 1921; (B. Long); two females.

Newfoundland, Barrens back of Port-aux-Basques; July 21, 1924; (B. Long); two immature males.

This material is all perfectly typical of this striking but uncommon bog-land species.

Oedipodinae

Camnula pellucida (Scudder). Nova Scotia. Colchester Co., Truro; July 24, 1914; one male. Lunenburg Co., Dublin Shore; July 27, 1919; one male (Hebard Cln.). This widespread form is probably present throughout most of Nova Scotia.

Dissosteira carolina (Linnaeus). Nova Scotia. Colchester Co., Dunfield; August 15, 1916; one female. Kings Co., Kentville; September 3, 1915; one male. Halifax Co., MacNab's Island; August 25—September 5, 1903; (Perrin); two males, one female; (Hebard Cln.). Yarmouth Co., Pubnico; September 6, 1924; (B. Long); one female.

*In addition to the material of this species recorded by Walker in his report on the Prince Edward Island material, I have examined a female from Mount Seward, July 20, 1912 that was collected by Bayard Long. Also I have before me a male from Hampton, Kings County, New Brunswick, that was collected August 17, 1913.

The common Carolina Locust is probably more widely distributed throughout Nova Scotia than the published records would seem to indicate.

Circotettix verruculatus (Kirby). Nova Scotia. Colchester Co., Truro; July 24-31, 1914; one male, one female. Halifax Co., Enfield; October 1, 1903; one female; (Hebard Cln.). Lunenburg Co., Dublin Shore; July 27—August 10, 1919: three males, one female; (Hebard Cln.). Digby Co., Howland Lake near Havelock; August 9, 1921; (B. Long); one female.

Newfoundland. Port-aux-Basques; August; one male, one female.

The Eastern Crackler which shares the same habitat as the Carolina Locust is evidently much more common in these areas than is the latter.

Cyrtacanthacridinae

Melanoplus bivittatus (Say). Nova Scotia. Colchester Co., Truro; July 24-August 16, 1914; three males, one female. Halifax Co., MacNab's Island; September 5, 1903; one female; (Hebard Cln.). Yarmouth Co., Gavelton; September 4, 1924; (B. Long; in meadow swale); one female: Tusket Lake; August 13, 1921; (B. Long); one female.

This grassland form is probably quite common throughout the meadows of Nova Scotia.

Melanoplus femur-rubrum femur-rubrum (De Geer). Nova Scotia. Halifax Co., Enfield; October 1, 1903; one female; (Hebard Cln.). Shelburne Co., Beaver Dam Lake (Bower's Lake); September 10, 1921; (B. Long); one female: above Jordan Falls; September 9, 1921; (B. Long; in *Corema* barrens); two females.

Piers has stated that this is probably the most common grasshopper in Nova Scotia.

Melanoplus borealis (Fisher). Newfoundland. Barrens back of Port-aux-Basques; July 21, 1924; (B. Long); one immature female.

This apparently is the first Newfoundland record for this form and it is unfortunate that it is not possible to determine which race it represents.

Melanoplus fasciatus (F. Walker)*. Nova Scotia. Yarmouth Co., Bog barrens backs of Goose Lake, Lower Argyle; August 11, 1920; (B. Long); one female.

Newfoundland. Salmonier; August 11-15, 1885; (R. Thaxter; in sphagnum bogs); one male; (Hebard Cln.).

Although this form is included in Pier's study of the Orthoptera of Nova Scotia, he had not seen any specimens from Nova Scotia and gave it as a hypothetical occurrence.

All of the material examined has relatively short wings.

Melanoplus mexicanus mexicanus (Saussure). Nova Scotia. Colchester Co., Truro; July 26-27, 1913; one male, one female. Yarmouth Co., Argyle Head; September 5, 1921; (B. Long); one female (teneral). Shelburne Co., Welchtown Lake; August 2, 1921; (B. Long); two females: above Jordan Falls; September 9, 1921; (B. Long; in *Corema* barrens); one male. Sable Island; one male; (Hebard Cln.).

This common species is probably quite widely distributed throughout Nova Scotia. The specimen from Sable Island has exceptionally long wings, these being almost as long proportionately as in the phase *spretus*.

TETTIGONIIDAE

Phaneropterinae

Scudderia pistillata Brunner. Nova Scotia. Kings Co., Delhaven; August 1898; one male; (Hebard Cln.).

*I have also examined a single, quite short winged, female of this species from Jack Lanes Bay, Labrador, which was collected September 15, 1924 by W. Koelz.

This interesting species is said to be rather common throughout parts of Nova Scotia.

Scudderia curvicauda borealis Rehn and Hebard. Nova Scotia. Shelburne Co., above Jordan Falls; September 9, 1921; (B. Long; in *Corema* barrens); one male.

This, the northern race of *curvicauda,* is found in suitable situation in Nova Scotia.

Conocephalinae

Conocephalus fasciatus fasciatus (DeGeer). Nova Scotia. Colchester Co., Truro; September 7, 1914; one female: Dunfield, August 15, 1915; one male. Kings Co., Kentville, August 17, 1916; one male. Digby Co., near Hassett; August 9, 1921; (B. Long); one female. Lunenburg Co., Frank Lake near Big Mushamush Lake; August 17, 1921; (B. Long); three females. Yarmouth Co., Gavelton Lake, Gavelton; September 4, 1920 (B. Long); one female: Gillfilly Lake, Quinan; August 23, 1921; (B. Long); one female.

This small katydid is evidently quite common throughout most of Nova Scotia. The material of this species that was collected by Long in Prince Edward Island was recorded by Rehn and Hebard in their study of the genus *Conocephalus* in North America (1915, Trans. Amer. Ent. Soc., XLI, 172).

GRYLLIDAE

Nemobiinae

Nemobius fasciatus fasciatus (DeGeer). Nova Scotia. Colchester Co., Truro; September 19, 1915; one male; October 9, 1913; one female.

This form is relatively common in Nova Scotia. The material of this species collected by Long in Prince Edward Island was recorded by Hebard in his study of the genus *Nemobius* in North America (1913, Proc. Acad. Nat. Sci. Phila., LXV, 418).

NOTES ON THE DISTRIBUTION OF PLEBEIUS AQUILO BDV. WITH THE DESCRIPTION OF A NEW RACE FROM MANITOBA (LEPID. LYCAENIDAE) *

BY T. N. FREEMAN,
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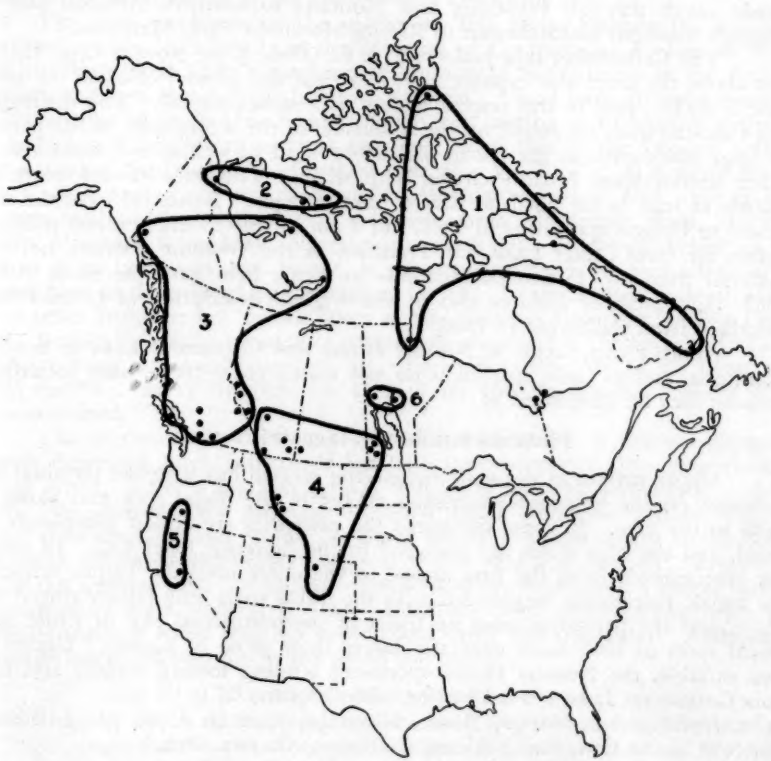
In different regions of North America, *Plebeius aquilo* Bdv. varies considerably in size and maculation and appears to be differentiated into at least six geographical races. The distribution of each of these known races is roughly outlined in the accompanying diagram, and the localities marked are represented by specimens in the Canadian National Collection.

The species was first described by Boisduval from Labrador (1832, Icon., 62, pl. 12, f. 7, 8), and a long series of specimens before me from Hopedale, Labrador, is considered as typical. The alar expanse of these specimens ranges from 19 to 23 mm., and the markings of the under surface vary somewhat in size and intensity, but the black spots in the postmedial white band of the secondaries are usually present and conspicuous. These specimens agree with the original description and figures of *franklinii* Curtis (1835, Ross App. 2nd Voy., p. lxix, pl. A, f. 8, 9) which is undoubtedly synonymous with *aquilo* and was probably described from the Boothia Peninsula. The variation of maculation in the Labrador series is sufficient to include the race *suttoni* from Southampton Island in Hudson Bay which Holland described and figured in the revised "Butterfly Book" of 1931. Leussler (1935, Bull. Brook. Ent. Soc., XXX, 58) recorded *aquilo* from Churchill, Manitoba, under the name *suttoni* Holl., but specimens from that locality appear to be identical with typical material from Labrador. Other series from Bradore Bay, Que., (Strait of Belle Isle)

*Contribution from the Division of Entomology (Systematic Entomology), Department of Agriculture, Ottawa.

and Lake Harbor, Baffin Island, and two specimens from Ellsmere Island all agree with those from Labrador. From this is concluded that typical *aquilo* ranges from Bradore Bay, Que., north-west through Labrador to Ellsmere Island and south to Churhill.

The north-western race *bryanti* Leuss. was described from Black Mountain, just south of Aklavik, N. W. T. (1935, Bull. Brook. Ent. Soc., XXX, 58). It resembles typical *aquilo* in size and in the color of the upper surface, but the ground color of the underside of the secondaries is lighter and devoid of any black spots. It presumably ranges along the Arctic coast from Aklavik to Bernard Harbor and Wollaston Land in the region of Coronation Gulf.



Distribution of Races of *Plebeius aquilo* Bdv. 1. *P. aquilo aquilo* Bdv. 2. *P. aquilo bryanti* Leuss. 3. *P. aquilo megalo* McD. 4. *P. aquilo rustica* Edw. 5. *P. aquilo podarce* F. & F. 6. *P. aquilo lacustris* n. var.

The race *megalo* McD. (1927, Can. Ent., LIX, 161) described from Mt. McLean, Lillooet, B. C., is much larger than the typical form, (23 to 26 mm.) and on the upper surface of the male, the dark outer margin of the secondaries tends to be sharply defined and contrasting. The ground color of the underside of the secondaries is brownish-grey, and the black spots are reduced in the post-median white band. This race extends from the Forbidden Plateau in central Vancouver Island north to the Kluane region in the Yukon, east to Great Bear

and Great Slave Lakes, and south along the high mountains of western Alberta to southern central British Columbia.

A few specimens from the east coast of James Bay and Charlton Island have the same alar expanse as *megalo*, but the markings on the underside resemble typical *acquilo*. Without more material it is impossible at present to ascertain if they are worthy of racial distinction.

The race *rustica* Edw. was probably described from material collected in the semi-arid region near the base of Pikes Peak, Colo., (1865, Proc. Ent. Soc. Phil., IV, 203). It has about the same alar expanse as *megalo* and can be distinguished by the light yellowish-grey ground color of the underside of the secondaries which are devoid of all black spots except the costal pair. From the material at hand, *rustica* appears to be a prairie race extending from Colorado north through Wyoming and Montana to southern Alberta, and east through southern Saskatchewan to Riding Mountain Park, Manitoba.

The Californian race *podarce* F. & F. (1865, Reise Novara Lep., II, 282) has about the same alar expanse as *rustica*, but the ground color of the underside is darker, and in this respect closely approaches *megalo*. The distinguishing characteristics are found on the underside of the secondaries in the presence of large black spots in the postmedial white band, as well as two basal and two outer similar spots broadly circled with white. This race extends from California at least as far north as Crater Lake, Oregon. Boisduval gave the name *nestos* to Oregon specimens in 1869, but I am unable to differentiate specimens before me from Crater Lake, San Francisco or the Yosemite districts, nor from material from the Tuolumne Meadows to which Behr gave the name *cilla* in 1867. Specimens of *podarce* also fit the original description of *tahama* Reak. described from California in 1866.

Another race occurs at Norway House and Cormorant Lake in northern Manitoba, and as these specimens do not match those from other localities, I propose they be designated as

Plebeius aquilo var. **lacustris** n. var.

Upper surface of the male resembling *megalo* but with the terminal dark suffusion on the primaries extending almost to the discal spot and along the costa to the base. In some specimens the primaries are almost completely suffused, and the blue scales are scattered in the posterior basal half. In *megalo* the blue extends from the base almost to the outer margin. Upper surface of the female resembling *megalo* but with the discal spots only faintly ringed with white, and the primaries show no traces of the postmedial row of white spots. Discal spots of both sexes generally larger than those of *megalo*. Under surface variable, the Norway House specimens tending toward *megalo* and those from Cormorant Lake toward *rustica*. Alar expanse 23 to 26 mm.

Holotype– ♂, Norway House, Manitoba, June 28, 1938, (W. J. Brown); No. 4521 in the Canadian National Collection, Ottawa. Ont.

Allotype– ♀, same data as holotype, June 25, 1938.

Paratypes–3 ♂, Norway House, Manitoba, June 25-28, 1938, (W. J. Brown); 3 ♂, Cormorant Lake, Manitoba, June 14, 1927, (J. Russell); 1 ♀, Norway House, Manitoba, June 25, 1938, (W. J. Brown).

SCOTOCHROA AND A CLOSELY ALLIED NEW GENUS, SCOTOCHROIDES, (COLEOPTERA, MELANDRYIDAE)

BY EDITH W. MANK,
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The Leng check list (1920) records under *Scotochroa,* which is a distinctly American genus established by Leconte in 1874, two species, *S. atra* Lec. and *S. basalis* Lec. *Scotochroa buprestoides* Kirby (described in 1837 as a *Xylita*) is listed under *atra,* indicating it as either a synonym or as being questionable as a valid species. The Csiki Catalogue of the *Serropalpidae* (1924) lists one species, *atra,* under *Scotochroa* with *buprestoides* given under this and with *basalis* as a variety. The Supplement of the Leng list (1927) records *basalis* as a variety of *atra.* The general question as to the species in this group seems to warrant a review of the genus with a key to the species.

The type specimens of the species in this genus include the Leconte specimens of *atra* and *basalis* in the Museum of Comparative Zoology at Harvard University and Kirby's specimen of *Scotochroa buprestoides* in the British Museum at South Kensington, London, England. These have all been examined. The type of *Scotochroa basalis* though not labeled as to locality is given in the original description as from Oregon. With this in the Leconte collection are other specimens from Garland Col. (1); W. T. (1); Marquette Mich. The type of *Scotochroa atra* is from Mt. Washington while with this in the Leconte collection are placed two specimens from Marquette Mich. In the British Museum, *Scotochroa buprestoides,* which will be shown below to be distinct from both *atra* and *basalis,* is given under the label *Scotochroa atra,* having been so determined by Champion (1916). In the British museum there is one other *Scotochroa, S. basalis* taken at Mt. Manitou, Colorado Springs, Colo.

Besides the specimens in the Leconte collection and in the British Museum, the *Scotochroa* in the collections of Mr. Charles Schaeffer, Mr. C. W. Leng, Dr. H. C. Fall, Dr. Henry Dietrich, Mr. C. A. Frost and Mr. Charles Liebeck have been examined.

The characteristics of the genus may be summarized as follows: elongate, slightly depressed, finely punctured but with no evidence of lines of punctures on the elytra. Color a blackish brown; fine, pale, prostrate pubescence. Head small, eyes convex, very prominent though small, antennae slender, slightly longer than the head and thorax but much less than ½ the length of the body. Prothorax narrowed anteriorly, margined at the base and laterally. Prosternal suture not elevated as in *Dircaea* but evident, anterior coxae with a lateral fissure, prosternum at least moderately long. Maxillary palpi never serrate, with the terminal segment wider than the second and third and trianguler. Abdominal segments margined laterally to the tip of the body.

KEY TO THE SCOTOCHROA.

A. Surface of thorax granulate punctate; hind angle of thorax less nearly a right angle than in the other species; base of thorax very feebly bisinuate; third segment of the antennae not as long as the fourth. The type is from the White Mountains ..... *atra* Lec.

AA. Surface of thorax with punctures but no granules; hind angle of thorax better defined than in *atra,* more nearly a right angle; base of thorax bisinuate; third segment of the antennae longer than the fourth.

B. Punctuation at least on the basal half of the elytra coarse with raised granules ..... *buprestoides* Kirby.

BB. Punctuation on basal half of the elytra shows no granules except under high power of the microscope and is less dense and less extensive than in the eastern form *buprestoides.* The type is from Oregon ..... *basalis* Lec.

Leconte used the bisinuate hind margin of the thorax and the better defined hind angle of the thorax to separate *Scotochroa basalis* from *atra*. Specimens, however, which have been included in collections under the name *basalis* include two species, *S. basalis* and *S. buprestoides*, both of which are valid species. These two types are readily separated from each other by the punctuation on the elytra. In *buprestoides*, the punctuation is coarse with raised granules covering at least half of the area from the base to the apex of the elytra. In *Scotochroa basalis* there are only slight traces of raised granules seen only under the higher powers of the microscope. These are indistinct and the granulation is less dense and less extensive in area than in the eastern form *buprestoides*.

Scotochroa atra Lec.

Antennae greater in length than the head and thorax but not extending half way down the elytra. Individual segments not widened apically. Third segment slightly shorter than the fourth.

Frontal suture only slightly evident. Thorax granulate punctate; hind angle not as nearly a right angle as in *basalis* and *buprestoides*, but broadly reflexed. Hind and lateral edges margined. Hind margin only slightly bisinuate, almost straight. Elytra very finely punctate but with no granules, hairs recumbent.

On under surface, coxal cavities with slight lateral fissure. Suture between the prosternum and episternum less flat than in other *Scotochroa* but not really elevated. Middle coxae separated by the mesosternal process. Abdominal segments laterally margined.

Specimens were examined that bore the place labels Mt. Washington; White Mountains; Marquette Mich.

Length 4.1–5 mm.; width 1–1.1 mm.

Scotochroa basalis Lec.

Antennae equal or only slightly greater than the head and thorax. Joints not obviously widened apically. Third joint longer than the fourth. Never more than the slightest indication of a frontal suture.

Thorax coarsely punctate, bisinuate on the basal edge, margined as is also the lateral edge. Hind angle of the thorax more nearly forming a right angle than in *atra*.

Elytra with punctures from which recumbent hairs arise. Only under the higher magnifications is there even a slight indication of granules. Anterior coxal cavities with a lateral fissure. Sutures between the prosternum and the episternum present but not elevated. Middle coxae separated by the mesosternal process. Abdominal segments in length like other *Scotochroa*. Segments margined laterally.

Specimens from Trinity Valley B. C. (1); Midday Valley, Merritt, B. C. (5); Lorna, B. C. (1); Glacier Park, Mont. have been examined.

Length 4–6.5 mm.; width 1.1–2.

Scotochroa buprestoides Kirby.

Antennae only slightly more than equal in length to the head and thorax Third joint longer than the fourth. Frontal suture indistinct.

Thorax closely punctate with coarse punctures but no evidence at all of granules. Hind angle of the thorax rectangular, basal margin bisinuate. Margined at the base and finely margined laterally.

Basal half of the elytra granulate punctate, becoming more indistinct posteriorly.

On the under side, coxal cavities with a lateral fissure. Suture between the prosternum and the episternum present but not elevated. Middle coxae separated by the process of the mesosternum. Abdominal segments margined laterally.

Scotochroa buprestoides is unlike *atra* in its punctate thorax and is unlike *basalis* in the granulate surface of the elytra.

Specimens from Little River, S. W. (1); N'f'l'd (1); Whiteface Mt., N. Y. (1) Chocorua, N. H. (1); Mich. (2); Montreal, Can. (1); Joliet, Que. (1). were examined.

Length 5–7 mm.; width 1.1–2 mm.

Scotochroides new genus.

While examining specimens of *Scotochroa,* a beetle in the collection of Dr. H. C. Fall, three in the collection of Mr. C. W. Leng, and two in the collection of Mr. C. A. Frost were found to be examples of an undescribed genus nearly related to *Scotochroa* but at once separated from this by the length and shape of the antennal joints. This new genus, for which I propose the name *Scotochroides,* has antennae much longer than the head and thorax, in fact, they reach about half way down the elytra with the individual joints somewhat triangular.

The genus may be described as follows: elongate, slightly depressed, testaceous in color, finely punctured, with an evidence of linear arrangement of punctures on the elytra. Head small; eyes small, convex, prominent. Antennae elongate so that they are about equal to half the length of the body, individual joints triangular, second joint about one quarter as long as the third. Thorax finely margined at the base and laterally. Prosternal suture not elevated, anterior coxae with a lateral fissure. Abdomen laterally margined to the tip.

Type species—*Scotochroides antennatus* n. sp.

Scotochroides antennatus n. sp.

Antennae much longer than the head and thorax, reaching about half way down the elytra. The third joint at least slightly longer than the fourth, the individual joints triangular, that is, much widened apically but not really serrate. Frontal suture visible.

Thorax closely granulate punctate with the granules making a rougher surface than in *Scotochroa atra.* Base of the thorax bisinuate and margined as is also the lateral margin. Hind angles broadly reflexed.

Basal half of the elytra without granules; clothed with fine recumbent hairs; although the surface is smooth, indistinct linear rows of punctures are evident.

On the under side, coxal cavities with lateral fissure; suture between the prosternum and episternum present but flat. Middle coxae separated by the mesosternum. Abdominal segments margined laterally. Male with the sixth segment visible. The type which came from the Leng collection is labeled N. Y. and is now in the author's collection.

Specimens from N. Y.; Bear Lake, Pa., Cornwall, Conn., Lexington, Mass., and Mt. Washington, N. H. were examined.

Length 4.1–5 mm.; width 1–1.7 mm.

BOOK NOTICE

"Our Wild Flowers: a plea for protection" by Frank Morris. Publication No. 3, Federation of Ontario Naturalists, 198 College St., Toronto. Price 10 cents.

This thirty-five page pamphlet covers a wide range of subjects and the author's excellent style has made it a very readable work as well as most interesting. There are three coloured plates of paintings of wild flowers by the late Robert Holmes. Some of the topics treated are, "The Old Sugar Bush", "The Life of a Flowering Plant", "The Balance of Nature", "The Value of Marshes and Swamps", and "Sanctuaries".

This is a concise treatment of the subject of conservation which is so much to the fore at the present time and should be a welcome addition to naturalists' libraries.

A NEW "NOMENCLATOR ZOOLOGICUS."

The preparation of this work, announced in 1935, is now approaching completion. It constitutes an attempt to bring together the names of all the genera and subgenera in Zoology that have been described from the tenth edition of Linnaeus, 1758, up to the end of the year 1935, with a bibliographical reference of the original description of each. It will also include the great majority of alternative spellings that have appeared during that period. Another feature that will, it is thought, be found valuable for systematists relates to cases where a new name has been proposed for a homonym. In these instances a cross-reference is given under the homonym to the new name.

It is estimated that the work will comprise some 225,000 entries, of which about 5,000 appear to have been omitted from all previous publications of this character. It is proposed to publish the work in four volumes of nearly 1,000 pages each, which it is hoped it will be possible to issue at intervals of about six months.

The Zoological Society of London has borne the whole cost of preparation. With the aid of various grants from outside sources, the Editor, Dr. Sheffield Neave, has now been able to arrange for printing and publication of the work. It is proposed to publish it at the low advance-subscription rate of six guineas post free for the four volumes, provided that a sufficient number of undertakings to subscribe can be obtained. If these are adequate, it is hoped to issue the first volume during this summer. Subscriptions should be addressed to the Secretary, Zoological Society of London, Regent's Park, London, N. W. 8.

PERSONAL NOTES

At the 33rd meeting of the American Entomological Society held in December 1938 at Richmond, Virginia, Mr. Kenneth M. King of the Division of Entomology was elected a fellow. At the same meeting Dr. E. M. Walker of the Department of Biology, University of Toronto was elected president for the ensuing year.

Mr. C. E. Petch was the recipient of a desk pen from the Entomological Society of Ontario as a token of appreciation of his great task in preparing the manuscript for the Index to the Annual Reports of the Society from 1900 to the present. This has been a truly monumental effort and some indication of the work involved is given by the fact that approximately forty thousand filing cards were used in the preliminary stages.

"The index was started as a labor of love" writes Mr. Petch in acknowledgment of the gift, "and any hope of reward was farthest removed from my mind and so the gift was the more a surprise but I hope the work I did will merit the thoughtfulness of the Society." Mr. Petch asks the Society to accept the following couplet as the expression of his thanks:

Thought is deeper than all speech
Feeling deeper than all thought.

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